Table 2. Comparison of In-Hospital Mortality with the TIMI, GRACE, and FD Risk Scores.

Patient	TIMI RS	GRACE RS	FD RS
1 (STEMI)	Intermediate	High (36%)	
2 (NSTEMI)	Low	Intermediate	Low
3 (STEMI)	High	High (36%)	
4 (NSTEMI)	Intermediate	High	Intermediate
5 (STEMI)	Intermediate	High (36%)	
6 (STEMI)	Intermediate	High (36%)	

FD=front-door; GRACE=Global Registry of Acute Coronary Events; NSTEMI=non-ST elevation myocardial infarction; RS=risk score; STEMI=ST elevation myocardial infarction; TIMI=Thrombolysis in Myocardial Infarction.

Unexpected Atrial Fibrillation During Pacemaker Implantation

Written by Toni Rizzo

Atrial fibrillation (AF) occurs unexpectedly in about 5% of pacemaker implantation procedures and is more common in patients with sick sinus syndrome (SSS) than in those with atrioventricular block. Meredith I. Sedney, MD, PhD, Ziekenhuis Bronovo, The Hague, the Netherlands, discussed problems when AF occurs during pacemaker implantation and potential solutions to the problems, citing data from the literature and from local experience.

Standard measurements for optimal positioning of electrodes during implantation cannot be obtained when AF persists. When this occurs, postoperative lead malfunction can occur, necessitating lead replacement. Some physicians switch from Atrial Demand Pacemaker (AAI) or Optimal Pacemaker (DDD) to Ventricular Demand Pacemaker (VVI) implantation, which induces pacemaker syndrome and increases the risk of AF. Electrical or chemical cardioversion to restore sinus rhythm prolongs the procedure, which increases the risk of infection and increases stimulation thresholds. Other possible solutions are blind lead positioning (using fluoroscopy without measurements) and mapping of the atrial wall to search for sufficient endocardial signal amplitude.

A review of pooled data from 3 studies on signal amplitude requirement at implantation (n=93) found that in all cases, the procedure was continued during AF and mapping of the AF wave was used to guide optimal lead placement. Sinus rhythm was achieved in <6 weeks in 95% of patients in one study [Wolfhard UF et al. *Pacing Clin Electrophysiol* 1998], 83% of patients in a German study [Driever R et al. *Zentralbl Chir* 2003], and in 34% (plus 66% by electrical cardioversion) in the third study [Wiegand UK et al. *Pacing Clin Electrophysiol* 2000].

The best reflection of electrode-endocardium distance is a high-frequency component (hfc); shorter distance and larger hfc result in better long-term pacing and sensing. Filtered signals have an hfc (slew rate) and are estimated by high-pass filters. A filtered signal has the advantage of showing the endocardial signal more clearly. Pacing system analyzers provide filtered signals as detected by the pacemaker.

Dr. Sedney and her colleagues investigated atrial lead performance over 5.2 years (range, 1 to 8 years) in 13 patients with unexpected AF. The amplitude of the filtered and unfiltered atrial endocardial signals was compared and used as a guide for electrode placement. During implantation a minimum of 0.5 mV of filtered signal was required. Indications for implantation were SSS (62%), complete heart block (23%), and others (15%). After the implant, 92% of patients converted to sinus rhythm in <6 weeks. Only 1 patient remained in chronic AF. All patients had good measurements of stimulation and sensing thresholds and none needed replacement for malfunction (Table 1).

Figure 1. AF Amplitude: Bronovo and Pooled Results.

Results	Bronovo (n=13)	Pooled (n=93)
IEGM (mV) filtered	1.5±1.0	
IEGM (mV) unfiltered	2.5±1.4	
IEGM (mV) mean		1.8
Problems during FU (%)	none	4.3
SR <6 weeks (%)	92	34-95

FU= follow-up; IEGM=intracardiac electrogram; SR=sinus rhythm.

Unexpected AF during pacemaker implantation can occur, which complicates the implant procedure. Data from the literature and from Ziekenhuis Bronovo Hospital show that fibrillatory endocardial signals can be used as a guide for optimal electrode placement. Using filtered signal as a guide can keep the implantation short and simple.

Risk Factors for Atrial Fibrillation in Women in an Urban Setting

Written by Rita Buckley

Atrial Fibrillation: A New Epidemic

Atrial fibrillation (AF) is one of the most common and chronic disorders in modern cardiology [Kirchhof P et al. *Europace* 2012], and its medical, social, and economic aspects are set to worsen in the coming decades [Camm AJ et al. *Europace* 2012]. Dawn Scantlebury, MBBS, DM, Mayo

Clinic, Rochester, Minnesota, USA, discussed risk factors for AF in women in an urban setting.

The latest European Society of Cardiology (ESC) Guidelines for the Management of AF [Camm AJ et al. *Europace* 2012] report an estimated prevalence in the developed world of approximately 1.5% to 2.0%, with the average age of patients steadily rising to between 75 and 85 years. AF confers a 5-fold risk of stroke and a 3-fold incidence of congestive heart failure and higher mortality.

AF is less prevalent in women, but the absolute number with the condition is higher because incidence increases with age and women live longer than men [Gowd BM, Thompson PD. *Cardiol Rev* 2012]. AF risk rises with increased left atrial volume, which is associated with high body mass index (BMI) [Stritzke J et al. *J Am Coll Cardiol* 2009]. Dr. Scantlebury and colleagues postulated that obesity would be a risk factor for AF in women in the Kentucky Women's Health Registry (KWHR).

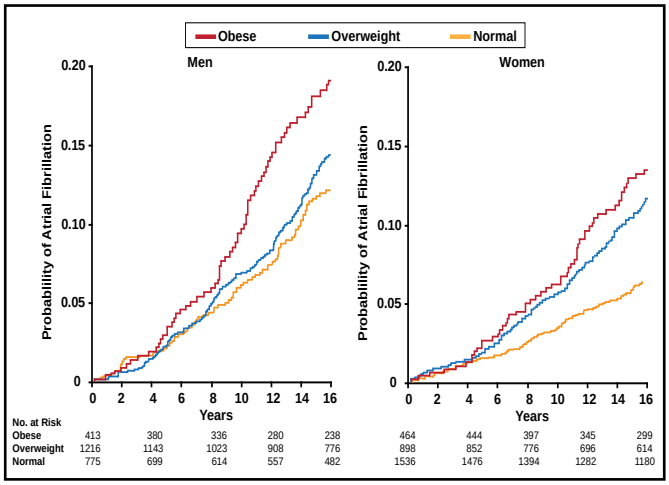
Online or paper questionnaires were administered to women who had indicated interest in being enrolled in research studies on the KWHR survey; content targeted gender-specific risk factors for AF. A total of 708 respondents—117 with AF and 591 controls—took part in the study.

Conventional risk factors significantly associated with AF included hypertension, coronary artery disease, rheumatic heart disease, valvular heart disease, and congestive heart failure ($p<0.001$). Obstructive sleep apnea, chronic obstructive pulmonary disease ($p<0.001$), and hyperthyroidism ($p<0.05$) were also significantly associated with the condition. Among those with AF, 60.3% were obese (BMI >30 kg/m^2); 68.6% of those without AF were obese. The authors failed to show a significant relation between obesity and AF ($p=0.08$).

Conversely, in multivariable models adjusted for cardiovascular risk factors and interim myocardial infarction or heart failure, Wang et al. [*JAMA* 2004] observed a 4% increase in AF risk per 1-unit increment in BMI in men ($p=0.02$) and women ($p=0.009$). Adjusted HRs for AF associated with obesity were 1.52 ($p=0.02$) and 1.46 ($p=0.03$) for men and women, respectively, compared with normal-weight individuals (Figure 1).

Prospective data raise the possibility that interventions to promote normal weight may reduce the population burden of AF [Wang TJ et al. *JAMA* 2004]. Henry [*West Indian Med J* 2011] contends that preventing obesity is a critical factor in controlling noncommunicable diseases, the main public health problem in the Caribbean (Figure 2), and that effective obesity control will require strategic environmental changes. Findings from Im et al. [*West J Nurs Res* 2012] suggest that unique programs that promote physical activity should be developed that consider women's ethnic-specific attitudes.

Figure 1. Framingham Study Data Show Higher Hazard Ratios for Obesity-Related AF.



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CCTA Proves Safe and Effective in Barbados

Written by Rita Buckley

Coronary computed tomographic angiography (CCTA) is an emerging tool for the noninvasive assessment of coronary artery disease (CAD) [Arbab-Zadeh A et al. *J Am Coll Cardiol* 2012]. Although coronary angiography (CA) is the gold standard for diagnosing CAD, it is an invasive and expensive procedure with a small (0.1% to 0.2%) risk of major complications, such as death, myocardial infarction, and stroke [Mowatt G et al. *Health Technol Assess* 2008]. Raymond Massay, MD, Bracebridge Medical Center, St. Michael, Barbados, discussed a study on the correlations between outcomes from 64-slice CCTA with retrospective gating and CA (Figure 1 and 2).

Figure 1. Left Anterior Descending Artery Angle: -44.0.

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